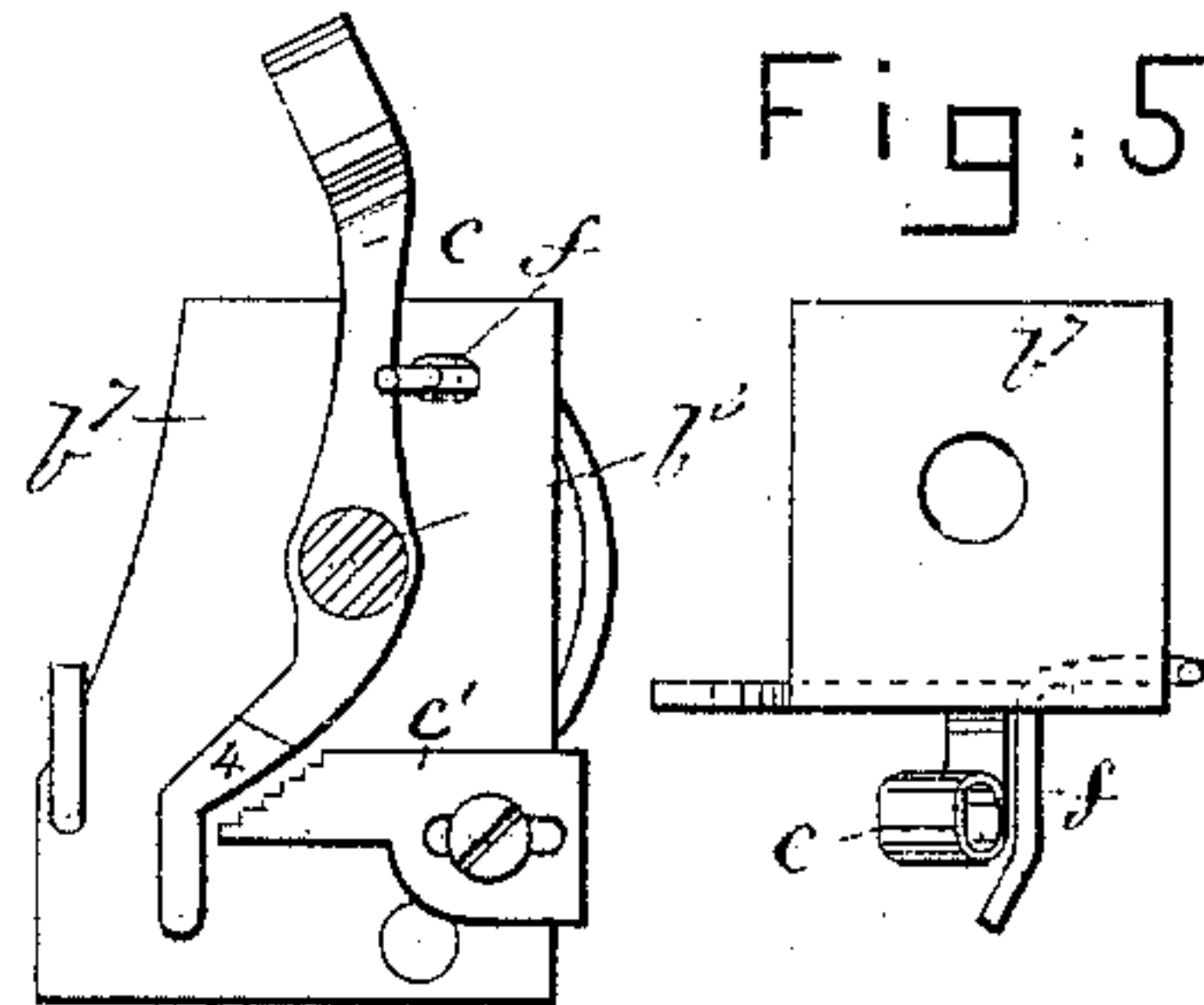
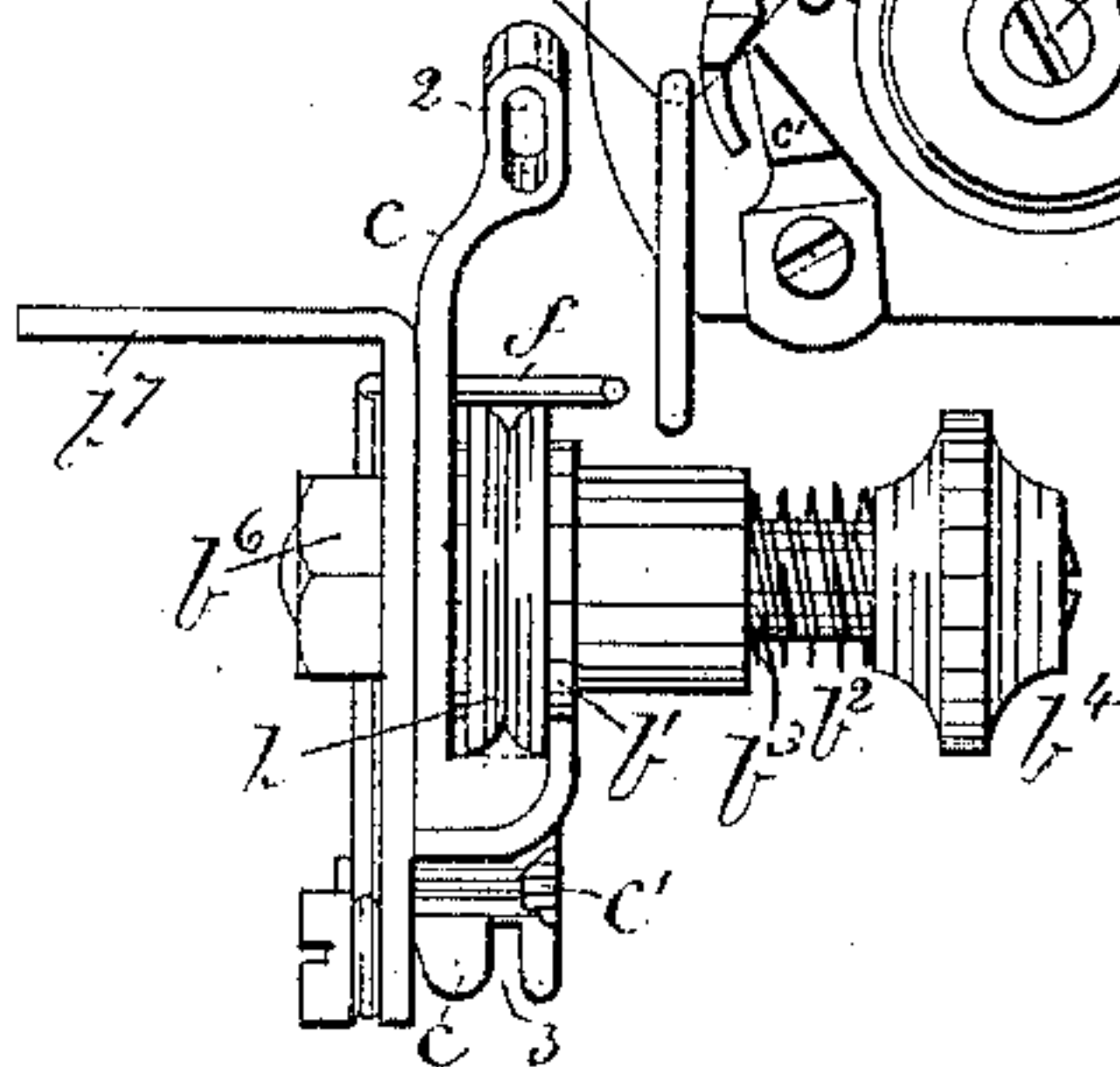
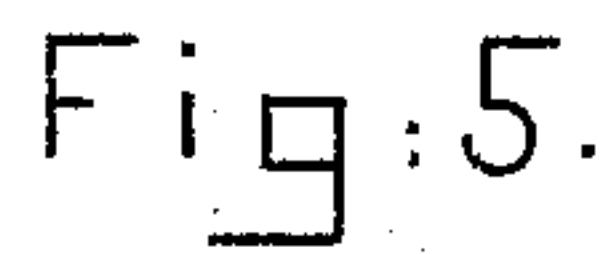
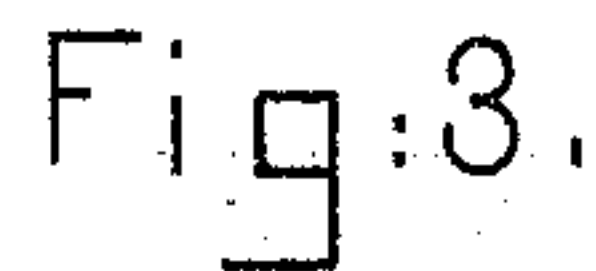
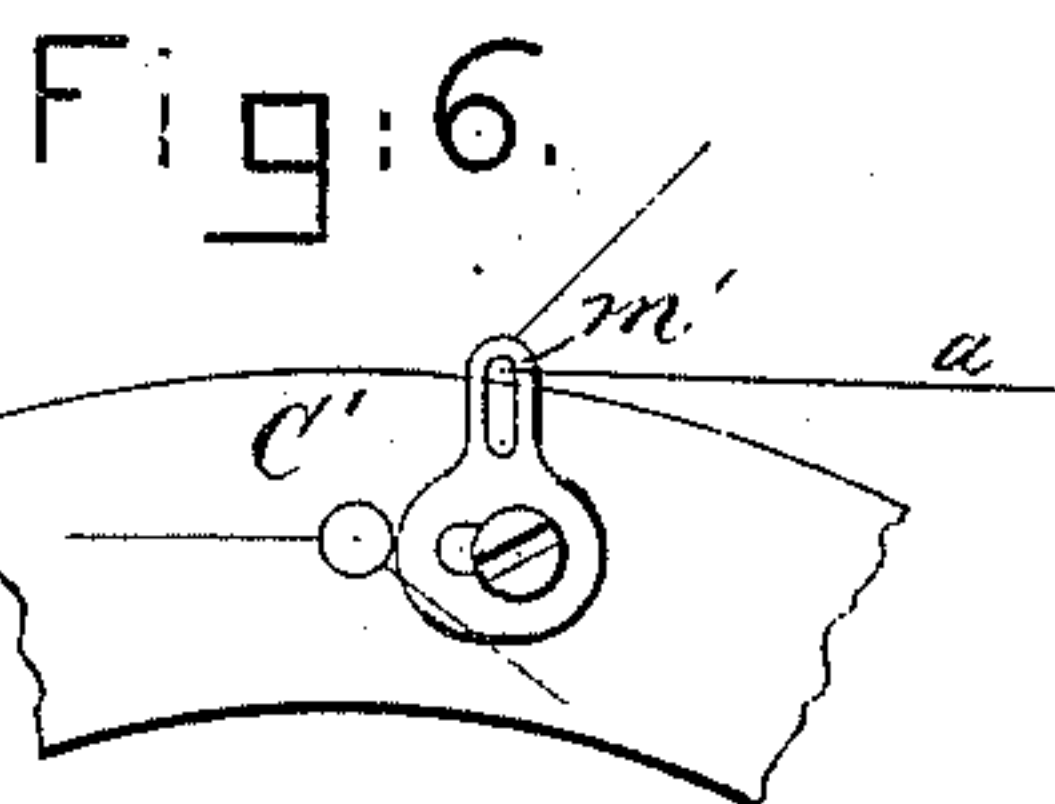


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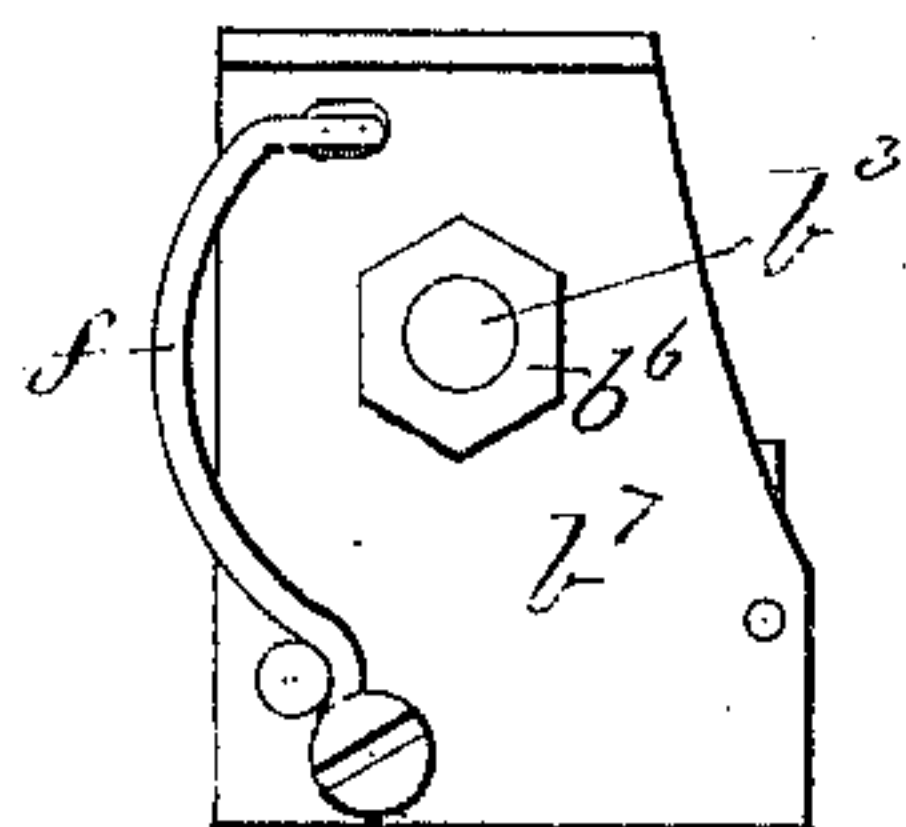
SEWING MACHINE.

Patented Feb. 10, 1885.



Witnesses.

Jos. A. Loomore
 J. H. Smith



Inventor.

William F. Beardslee
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(No Model.)

2 Sheets--Sheet 2.

W. F. BEARDSLEE.

SEWING MACHINE.

No. 311,943.

Patented Feb. 10, 1885.

Fig: 8.

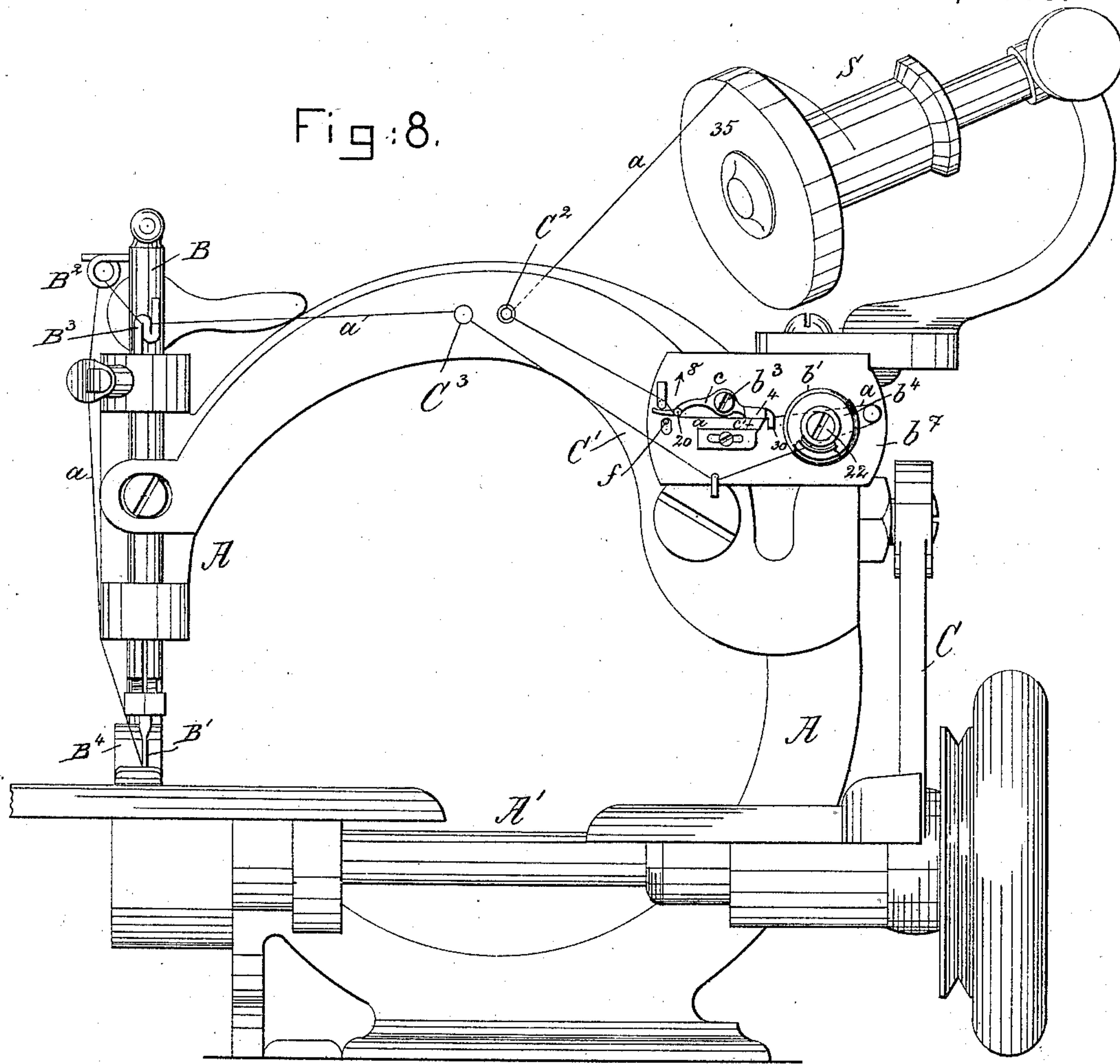
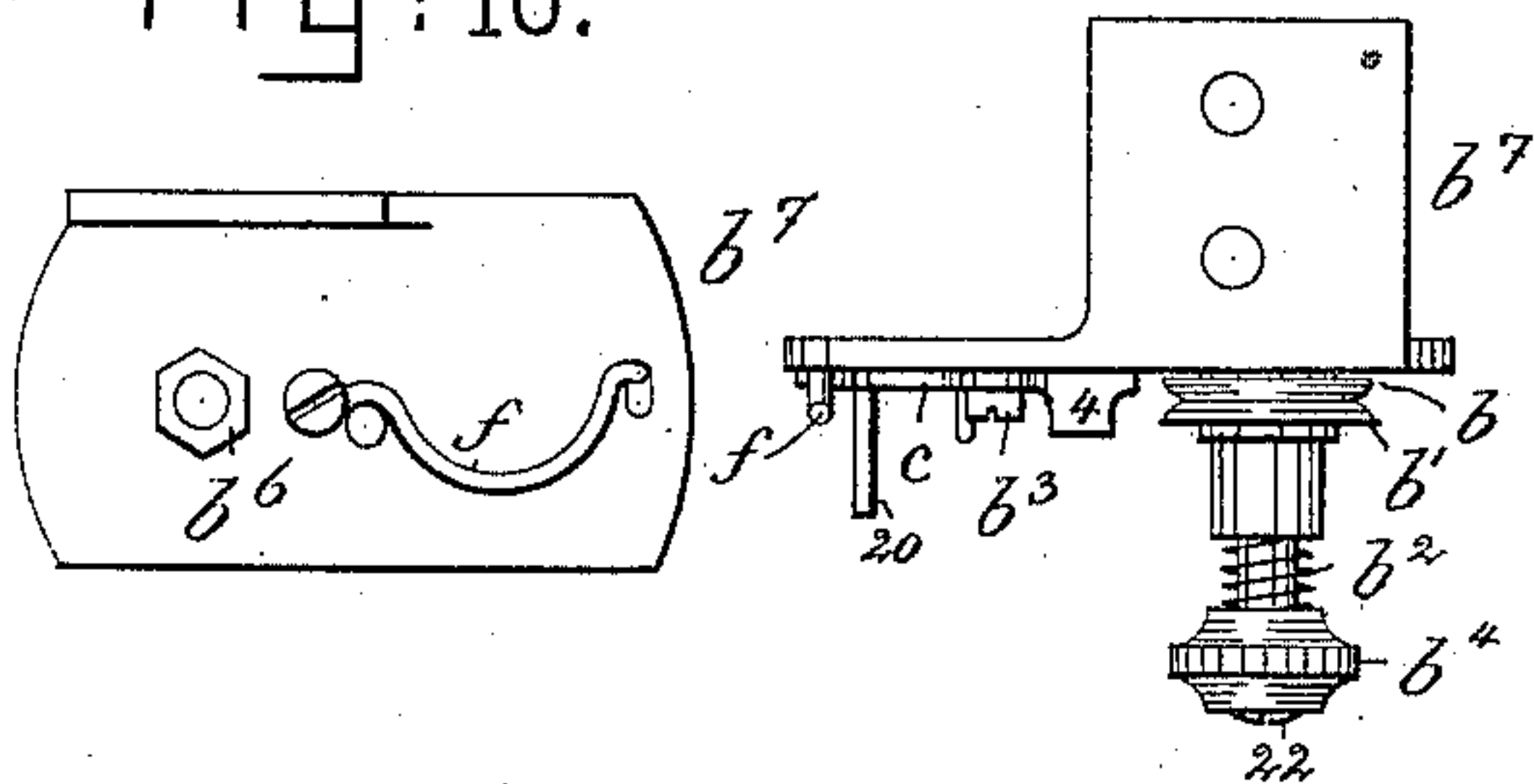


Fig: 9.

Fig: 10.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM F. BEARDSLEE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
MANUFACTURERS SPECIAL MACHINE COMPANY, OF DANBURY, CONN.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 311,943, dated February 10, 1885.

Application filed August 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BEARDSLEE, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has special relation to a thread-clamp adapted to act directly upon and clamp the needle-thread between the eye of the needle and the pull-off device, which takes from the thread-supply, preferably a spool or bobbin, a sufficient quantity of thread for the next stitch.

My present invention is shown applied to a Willcox & Gibbs sewing-machine, but may be applied to any other well-known sewing-machine wherein the thread is drawn from the spool by a pull-off device acting on the said thread during the descent of the needle-bar, the needle-thread being positively clamped at such time between the pull-off and the eye of the needle by a lever forming part of a clamp and deriving its movement to so clamp the thread by the strain upon one end of it of the needle-thread. In the usual Willcox & Gibbs machine the thread-clamp is actuated positively by an eccentric or equivalent upon the hook-shaft, and once adjusted it always acts to clamp the thread just as the needle and hook reach a certain position during the formation of each stitch, and the same amount of needle-thread is drawn from the spool by the pull-off, and this irrespective of the thickness of the material, so that as the material increases in thickness or a seam comes under the needle the stitches are drawn into the material more closely, or under greater tension, and at the same time, for quite thick material, the thread, if not broken off, will be so drawn by the hook and the elevation of the needle-bar as to render through the usual tension device and the clamp and through the pull-off and from the spool. In order to sew elastic and other soft goods in the best possible manner and have the stitch uniformly set, notwithstanding sudden variations in thickness, as when crossing seams, I have discovered that the clamp which acts to hold the

needle-thread must derive its clamping movement directly from the needle-thread when the same is acted upon by the pull-off during the descent of the needle-bar, strain on the thread by the hook, or by the needle-bar beyond the usual tension device, being effective to draw the thread freely, as usual, from the tension and the spool, except at just the time that the pull-off is acting, the latter acting gradually and only during the descent of the needle-bar, the pull-off acting in no sense as a take-up and in no manner and in no degree acting to pull up the stitch and draw or set the loop in the fabric being sewed. Each end of the lever constituting the movable member of the thread-clamp is provided with a suitable rest or guide to support and direct the needle-thread. When the needle-bar is rising, one end of the lever constituting the movable member of the thread-clamp will occupy its normal position, and the needle-thread will be subjected only to the tension of the usual tension device, no matter what may be the thickness of the material under the needle. In this my improved apparatus the pull-off, when the stitching is commenced, draws from the thread-supply a quantity of thread sufficient for the thickest material to be stitched, and leaves slack thread between the tension device and thread-supply, and the slack thread taken from the thread-supply by the pull-off is delivered to the rising needle and hook in varying quantities, according to the thickness of the material, and the needle-thread at each descent of the needle-bar, after the stitching is commenced, acts to turn the lever constituting the movable member of the needle-thread clamp so as to clamp the needle-thread sooner or later during the descent of the needle-bar, according to the amount of needle-thread taken by the preceding stitch, whereas in all other clamping tensions known to me the needle-thread is clamped at just the same period in the descent of the needle-bar with all thicknesses of material, and it is in mechanism for clamping the needle-thread sooner or later, according to the thickness of the material, that my invention consists.

Figure 1, in side elevation, represents a sufficient portion of a Willcox & Gibbs sewing-

machine to enable my invention to be understood; Fig. 2, a front elevation, somewhat enlarged, of the needle-thread clamp and the tension device; Fig. 3, a right-hand side elevation of Fig. 2, with the tension device removed. Fig. 4 is a left-hand side elevation of Fig. 2. Fig. 5 is a top view of the thread-clamp; Fig. 6, a modification to be described. Fig. 7 shows a modification in which the thread-clamp has its fulcrum at one side of the center of motion of the tension device; Fig. 8, a side elevation of a Willcox & Gibbs sewing-machine with yet another modified form of thread-clamp applied to it, and Figs. 9 and 10 are respectively top and rear side elevations of the clamp and tension device and the bracket by which the said parts are attached to the frame of the machine.

The frame-work A, rotating hook-shaft A', needle-bar B, needle B', thread-guides B², B³, and C³, thread supply or spool S, holder B⁵, connecting-rod C, and needle-bar-actuating lever C', provided with eye C², which constitutes the pull-off to act upon the needle-thread between the thread-supply and the clamp, to be described, are all as common to the Willcox & Gibbs machine.

The tension device consists, as herein shown, of two disks, b b', a spring, b², the threaded stud or pin on which the said disks are placed, and an adjusting-nut, b⁴; but instead of the exact tension device herein shown I may employ any other well-known form of tension device the pressure or force of which against the needle-thread a may be regulated as desired by a nut or other equivalent regulating device.

Near the tension device, and mounted upon a stud or pin, b³, attached by nut b⁶ to the bracket b⁷, is the lever c, which constitutes the movable member of the thread-clamp, the co-operating member being a stationary and preferably an adjustable block, c', having preferably a finely-serrated face, as shown in Figs. 1, 2, and 3, or a thin edge, as in Fig. 7, or as a smooth broad face, as shown in Fig. 8, the said block being adjustable to better adapt it to the diameter of the thread employed.

The lever c shown in Figs. 1, 2, and 3, as well as the lever c shown in Fig. 7, has at each end suitable openings or guides 23, such as shown clearly in Fig. 2, which serve to receive and guide the needle-thread; but the lever c of the form shown in Figs. 8 and 9, instead of the said openings 23, has projecting pins and fingers 20 and 30 to direct the needle-thread and cause it to be guided properly from end to end, and longitudinally with relation to the said lever, both the openings and the pins acting alike to prevent the escape of the needle-thread from the said lever.

In Figs. 1 and 2, the tension device referred to has as its center of motion the fulcrum b³ of the lever c; but in Figs. 7, 8, and 9 the said tension device is mounted upon a different or independent pin, 22.

In Fig. 1, the needle-bar is supposed to be

descending and the pull-off C² is acting on the needle-thread to turn the lever c, constituting the movable member of the clamp, in the direction of the arrow 8, Fig. 1, and cause the face 4 of the said lever c to clamp the needle-thread between it and the block c', and the thread having been clamped the further movement of the pull-off acts to draw thread from the thread supply or spool and effectually prevents drawing of the thread from the needle.

In Fig. 1, as well as in all the modifications herein shown, the pull-off is so located and so acts as to pull upon the needle-thread between the thread-supply and the clamp; but in Figs. 1, 2, 3, and 7, the thread, in passing from one to the other end of the lever c, is passed about the tension device, but in Figs. 8 and 9 the thread does not pass about the tension device until it has entirely left the said lever; but in all forms herein shown the principle of operation is the same, and the modification shown in Figs. 8 and 9 is only to show that the needle-thread may be wholly acted upon and controlled by the clamp, as described, before the said thread reaches the tension device.

In the various forms of my invention herein described the needle-thread is free to render from the tension device to compensate for the thickness of the material during the entire upward movement of the needle-bar, more or less slack in the needle-thread between the tension device and thread supply or spool being taken up as required in completing the stitch, and as the needle-bar descends the lever of the thread-clamping device is moved sooner or later by the strain of the thread acted upon by the pull-off, according to the amount of the slack thread between the clamp and the thread supply or spool which was taken up during the last ascent of the needle-bar, thus producing a variable clamping action on the needle-thread, according to the length of thread taken to accommodate variations in the thickness of the material being sewed. The lever c of the movable member of the clamp may have a back-stop to limit its movement in one direction. This back-stop may be made as a spring, f, as in Figs. 1 to 4, and as in Figs. 8 to 10, or may be rigid, as shown at 24, Fig. 7. The spring-stop is however preferable, as upon the occurrence of knots or bunches in the thread it is free to yield sufficiently to obviate breaking the thread.

The stop f, whether a spring or rigid, is so located as to nearly touch the rear side of the lever c of the movable member of the clamp at one side of its fulcrum b³, when the said member is in its normal position, or just before the pull-off begins to act and turn it.

In Fig. 5 the lever c is shown as away from the said stop f; but should a knot or bunch in the needle-thread pass between the surface 4 and the block c' the said lever c would be so turned as to act against the said spring, and the latter yielding would allow the knot or

bunch to pass, and thereafter the knot, if of sufficient size, will cause the needle-thread to be broken at the eye of the needle. This spring-stop *f* also, it will be noticed, allows the lever *c* to be turned far enough to remove the surface 4 from the block *c'* to enable lint, &c., to be removed, which is of great convenience.

In Fig. 1 the thread is extended through an eye in the arm *C'*; but in connection with the said arm, instead of the said eye, I might employ an adjustable bracket provided with a loop, *m'*, to receive and pull off more or less of the thread at each descent of the needle arm and bar, according to the position of the said loop *m'*. This bracket and loop are shown in Fig. 6.

I am aware that it is not novel by means of a take-up operated during the ascent of the needle to pull up the loop of needle-thread to finish the stitch, and at the same time pull off some additional thread from a spool. The devices herein described have no such action.

I claim—

1. The combination, in a sewing-machine with stitch-forming mechanism and a thread-supply, of a pull-off, a tension device, and a

clamping device having a lever constituting its movable member, the pull-off acting upon the needle-thread during the descent of the needle-bar to pull a certain amount of thread from the thread-supply, and at the same time operate the said lever to clamp the thread between it and the stationary member *c'* of the clamp, the combination being and operating substantially as described.

2. In a sewing-machine containing stitch-forming mechanism and thread-supply, a pull-off device to act upon the thread and pull it from the thread-supply, and an adjustable block, *c'*, combined with a lever, *c*, provided with a surface, 4, opposed to the said block to clamp the thread passing between them, the said lever being acted upon at one end by the needle-thread to cause its other end, in conjunction with the said block, to clamp the thread, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM F. BEARDSLEE.

Witnesses:

GEO. W. GREGORY,

JOS. P. LIVERMORE.